CLAIMS

1. Spectroscopic ellipsometer (1) comprising :

- a light source (2) emitting a light beam (3),
- a polarisation state generator section (4) containing a collimation optic (9) collimating said beam (3) and a generator of polarisation (10) that polarises the light beam,
- a first mirror (5) focusing the beam (3) to a small spot on the surface of a sample (1) at an incidence angle θ,
- a second mirror (6) connecting the beam modified by the sample (1) to an analysing section (7) comprising a polarisation analyser (17) that analyses the beam,
- means (8) for detecting and analysing spectroscopically said beam,

wherein

- the first (5) and second (6) mirrors are parabolic mirrors,
- the light beam through the polarisation state generator section (4) up to the first mirror (5) is parallel enabling achromatism,
- the light beam from the second mirror (6) through the analysing section (7) is parallel enabling achromatism,

and

- said incidence angle θ is largely varied without shifting of the location of the small spot on the sample surface (1).

2. Spectroscopic ellipsometer according to claim 1, wherein the generator is polarisation (10) is a photoelastic modulator.

3. Spectroscopic ellipsometer according to claim 1, wherein the generator of polarisation (10) is a rotating analyser.

4. Spectroscopic ellipsometer according to claim 1, wherein the generator is polarisation (10) is a rotating polariser.

5. Spectroscopic ellipsometer according to claim 1, wherein the generator of polarisation (10) is a rotating compensator.

6. Spectroscopic ellipsometer according to any one of claims 1 to 5, wherein the polarisation state generator section (4) and the analysing section (7) are translated vertically with respect to the parabolic mirrors (5, 6) to vary the incidence angle θ.

7. Spectroscopic ellipsometer according to any one of claims 1 to 5 wherein both mirrors (5, 6) and the sample (1) are vertically translated with respect to the analysing section (7) and polarisation state generator section (4) to vary the incidence angle θ.

8. Spectroscopic ellipsometer according to any one of claims 6 and 7, wherein the incidence angle θ is varied between 0° and 90°.

9. Spectroscopic ellipsometer according to any one of claims 1 to 8 wherein the said two parabolic mirrors (5, 6) have the same optical characteristics.

10. Spectroscopic ellipsometer according to any one of claims 1 to 9, wherein the axis of both parabolic mirrors (5, 6) and the sample surface are merged.

11. Spectroscopic ellipsometer according to claim 10 wherein both parabolic mirrors (5, 6) are positioned symmetrically with respect to a plane passing by their optical axis and being normal to the sample surface.

12. Spectroscopic ellipsometer according to any one of claims 1 to 11, wherein the shape of the parabolic mirrors (5, 6) is manufactured by diamond turning.

13. Ellipsometric system according to claim 12, wherein the distance from the polarisation state generator section (4) to the sample (1), and the distance from the analysing section (7) to the sample (1) are optimised to avoid diffraction influence created by diamond turning artefact.

14. Spectroscopic ellipsometer according to claim 13, wherein the parabolic mirrors (5, 6) are treated with a post-polishing process.

15. Spectroscopic ellipsometer according to claim 1 to 14, wherein the size of the spot is close to the diffraction limits.